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EXAMINER

STEELMAN, MARY J

ART UNIT PAPER NUMBER

2122

DATE MAILED: 02/25/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/993.991

Applicant(s)

MOORE ET AL.

Examiner

Mary J. Steelman

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 November 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-15 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 09 January 2002 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 01/09/2002.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

1. Claims 1-15 are pending.

Oath/Declaration

2. Examiner objects to the oath. Oath should reference '37 CFR 1.56', and not be limited to 1.56 (a). Delete the '(a)'.

It does not state that the person making the oath or declaration acknowledges the duty to disclose to the Office all information known to the person to be material to patentability as defined in 37 CFR 1.56.

Information Disclosure Statement

3. IDS received 9 January 2002 has been considered.

Drawings

4. The drawings submitted 9 January 2002 are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description:

FIG. 1, #30 is not in the Specification.

FIG. 1, #23, mentioned in the Specification at page 6; line 10, is not in the drawing. 21a, '22-CBSC' should be renumbered as '23-CBSC'.

Corrected drawing sheets in compliance with 37 CFR 1.121(d), or amendment to the specification to add the reference character(s) in the description in compliance with 37 CFR 1.121(b) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate

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prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either **“Replacement Sheet”** or **“New Sheet”** pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

5. It is unclear to the Examiner whether claim 1 recites “a first version”, “a second version” and “an upgraded second version (a third version?)” Is the invention upgrading from a first version to a second version and operating the second version? Or is the invention upgrading a second version and operating the second version (which is not an upgraded second version)? Examiner suggests rewording the claim. Examiner will treat claim as if a first version exists on a first controller, and is replicated on a secondary controller, after which the version on the secondary controller is updated to an ‘updated second version’. Rewording of claims 1-3, and similarly in all related claims, is suggested.

Consider the following:

Per claim 1:

A checkpointing method of stabilizing a wireless communication systems during an upgrade of services, the wireless communication system having a primary controller comprising a first version of a control application, a secondary controller comprising a replicated first second version of a control application, and a checkpointing service, the method comprising the steps of:

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- operating the first version of a control application by the primary controller to control the wireless communication system;
- saving state data in a first format, wherein the state data is representative of a stable operation of the wireless communication system,
- wherein the first format of the state data is compatible with the first version of a control application;
- utilizing the checkpointing service to save the first format of the state data to the secondary ~~processor~~ controller;
- upgrading the replicated first version of a control ~~program~~ application on the secondary controller to create an upgraded second version of a control application;
- quiescing the primary controller;
- operating the upgraded second version of a control application on the secondary controller to control the wireless communication system;
- converting the saved first format of the state data ~~from the first format~~ to a second format of the state data, wherein the second ~~state data~~ format of the state data is compatible with the upgraded second version of a control application;
- operating the upgraded second version of a control application on the secondary controller to control the wireless communication system, wherein the upgraded second version utilizes the converted second format of the state data to ensure wireless communication stability.

Per claim 2:

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A method as defined in claim 1, wherein the wireless communication system further has a version control table containing the version number ~~or~~for the first version of a control application on the primary controller and the replicated first version of a control application on the secondary controller ~~second version of a control application.~~

(Claims 1 and 7 recite, "...a version control table containing the version number **or** the first version of a control application and the second version of a control application." Is it possible that the 'or' should be a 'for'?)

Per claim 3:

A method as defined in claim 2, wherein the step of upgrading the replicated first version of a control application on the secondary controller thereby creating an upgraded second version of a control application further comprises the steps of:

- updating the version control table with the new version number of the upgraded second version of a control application;
- comparing the version number ~~or~~for the replicated first version of a control application on the secondary controller to the upgraded second version of a control application on the secondary controller to determine the upgraded second version of a control application has been upgraded.

Claim Rejections - 35 USC § 112

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

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7. Claims 1-5 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

8. Claim 1 recites the limitation "the secondary processor" and "the second state data format" on page 13, lines 12 & 13 and line 19, respectively. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claims 1, 4-6, and 9-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent 6,101,327 to Holte-Rost et al.

Per claim 1:

A checkpointing method of stabilizing a wireless communication systems during an upgrade of services, the wireless communication system having a primary controller comprising a first version of a control application, a secondary controller comprising a second version of a control application, and a checkpointing service, the method comprising the steps of:

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(Col. 4, lines 31-33, “The method...provides means to synchronize (checkpointing) the state transfer of static processes within the old to the new version (upgrade) of software”, col. 5, lines 40-41, “...to be used in a SPC (stored program control / controllers) telecommunications exchange system...”, col. 6, lines 1-3, “The software that is most frequently replaced or upgraded...ISDN, GSM (global system for mobile communications / wireless) ...”)

-operating the first version of a control application to control the wireless communication system;

(Col. 6, lines 11-12, “...normal traffic runs on the old version of software.”)

-saving state data..., wherein the state data is representative of a stable operation of the wireless communication system,

(Col. 7, lines 4-8, “...the old software will by means of that signal be aware...and prepares for the transfer of states (save state). The old static process publishes or activates an application defined interface for transferring the state...”)

-wherein the ... state data is compatible with the first version of a control application;

(Col. 7, lines 6-8 & 12-13, “...old software static process publishes or activates an application defined interface (compatible interface for state data) for transferring the state...With publication is meant defining (compatibility) the way the process communicates with other processes...”, “The old static process may also inform neighbouring processes (compatibility) ...about a forthcoming termination...”)

-utilizing the checkpointing service to save the state data to the secondary processor;

(Col. 9, lines 28-32, "Before the upgrading procedure starts traffic will run as normal on the old software...the old static process is informed about the forthcoming termination due to system upgrade with the operation PrepareShutdown (checkpointing service), after which the application activates or publishes the interface for state transfer (save state and prepare to transfer to secondary processor)...")

-upgrading the second version of a control application;

(Col. 6, lines 20-21, "The software to be replaced is referred to as a change unit.", col. 6, lines 34-36, "Thereafter all 'new' traffic initiated after the test traffic has come to an end will be handled by the new software (upgrade to the second version) ."

-quiescing the primary controller;

(Col. 8, lines 2-4, "After the CommitShutdown signal has been given all traffic will be handled by the new version...")

-operating the upgraded second version of a control application to control the wireless communication system;

(Col. 8, lines 6-11, "...the new process now is the sole owner of the resource objects...This is indicated by the CommitTakeover signal...when the system upgrade function is committed...")

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-converting the saved state data...wherein the second state...is compatible with the upgraded second version of a control application;

(Col. 7, lines 42-44, "the static processes within the new software are ordered to claim all resource objects of the static processes within the old software with a Takeover signal (all saved state is transferred to the new version)", col. 6, lines 30-35, "The new change unit (new version) is by definition chosen to have an interface that is compatible...the unchanged software (old version) is able to cooperate with both the old and the new software version (change unit)" The interfaces handle format compatibility.)

-operating the second version of a control application to control the wireless communication system,

(Col. 8, lines 6-10, "CommitTakeover signal...upgrade function is committed (second version of control application controls system)...")

-wherein the second version utilizes the converted state data to ensure wireless communication stability.

(Col. 8, lines 6-8, "the new process (second version) now is the sole owner of the resource objects (converted state data) previously claimed from the old process.", col. 3, lines 56-59, "Principal requirements satisfied by the smooth software change techniques with state transfer of the present invention include minimal or no user disturbance and a high level of system availability (ensure stability)."

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Holte-Rost failed to disclose specifically a “first format” and a “second format” for the saved state. However, he did indicate that state was saved and using an interface that enforced compatibility, state was transferred to the new version. Col. 4, lines 38-48,

“PrepareShutdown...prepares the application...After receiving the ...signal the static process in the old software publishes or activates an application specific interface for the transfer of resource objects (states). A resource object is an object type whose main purpose is to handle information on a hardware resource or an internal data structure...” Therefore, it would have been obvious, to one of ordinary skill in the art, at the time of the invention, to understand that Holte-Rost’s resource object was storing the state in a ‘first format’ and after the transfer of the resource object the state was held in a ‘second format’.

Per claim 4:

A method as defined in claim 1, wherein the wireless communication system comprises a network element.

(FIG. 2, col. 5, lines 20-21, “shows the system architecture in a general telecommunications system.” GSM is global system for mobile communications (wireless). Col. 5, lines 41-47, A general telecommunication system, including a switch, distributed processors (network elements)...the switch is connected to one or more processors...”)

Per claim 5:

A method as defined in claim 4, wherein the network element is an element selected from the group consisting of a Base Transceiver Station (BTS), a Mobile Switching Center (MSC) , a

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Base Station Controller (BSC), a Centralized Base Station Controller (CBSC), a Radio Network Controller (RNC), a Gateway Switching Node (GSN), a Node B, and a mobile unit.

(FIG. 2, col. 5, lines 20-21, "shows the system architecture in a general telecommunications system." GSM is global system for mobile communications (mobile unit). Col. 5, lines 41-47, A general telecommunication system, including a switch (mobile switching center / gateway switching node)), distributed processors (network elements)...the switch is connected to one or more processors...")

Per claim 6:

A checkpointing method of stabilizing a wireless communication systems during a downgrade of services, the wireless communication system having a primary controller comprising a first version of a control application, a secondary controller comprising a second version of a control application, and a checkpointing service, the method comprising the steps of:

- operating the first version of a control application to control the wireless communication system;
- saving state data in a first format, wherein the state data is representative of a stable operation of the wireless communication system, and wherein the first format of the state data is compatible with the first version of a control application;
- utilizing the checkpointing service to save the state data to the secondary processor;
- downgrading the second version of a control application;
- converting the saved state data from the first format to a second format, wherein the second state data format is compatible with the downgraded second version of a control application;

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-quiescing the primary controller; operating the downgraded second version of a control application to control the wireless communication system;

-operating the second version of a control application to control the wireless communication system, wherein the second version utilizes the converted state data to ensure wireless communication stability.

The limitations of claim 6 are similar to claim 1 except that claim 6 calls for a downgrade as compared to an upgrade as claimed in claim 1. Official notice is given that a downgrade is a modification from one software version to another software version and as such the rejection of claim 1 applies. Furthermore, Holte-Rost disclosed reversion of software. See FIG. 5. Col. 8, lines 21-22, “The reversion during system upgrade can be carried out at any time prior to the CommitShutdown signal...”)

Per claim 9:

A method as defined in claim 6, wherein the wireless communication system comprises a network element.

(See rejection of limitations as addressed in claim 4 above.)

Per claim 10:

A method as defined in claim 9, wherein the network element is an element selected from the group consisting of a Base Transceiver Station (BTS), a Mobile Switching Center (MSC), a Base Station Controller (BSC), a Centralized Base Station Controller (CBSC), a Radio

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Network Controller (RNC), a Gateway Switching Node (GSN), a Node B, and a mobile unit.

(See rejection of limitations as addressed in claim 5 above.)

Per claim 11:

An apparatus for ensuring wireless communication stability during an update of a wireless communication system, the apparatus comprising:

- a first computer processor running a first version of control software, the first computer processor further having a first database capable of saving state data in a first version format representative of steady state operation;
- a second computer processor running a second version of control software, the second computer processor further having a second database capable of receiving the state data from the first database in a second version format to replicate the steady state operation of the first computer processor;
- a checkpointing service to transfer the steady state data from the first database to the second database; and a control block to translate the steady state data from the first version format to the second version format.

Claim 11 is an apparatus version of claim 1. FIG. 2 shows the system architecture (apparatus) in a general telecommunications system. Col. 5, lines 39-47, "...used in a SPC telecommunications exchange system (apparatus)..." Claim 11 also requires database storage. Holte-Rost disclosed storage at col. 3, line 39-41, "...transaction oriented software together with a memory capable of

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storing (database) both old and new software version at the same time. The rejections as addressed in claim 1 apply to claim 11.

Per claim 12:

An apparatus as defined in claim 11, wherein the wireless communication system comprises a network element.

(See rejection of limitations as addressed in claim 4 above.)

Per claim 13:

An apparatus as defined in claim 12, wherein the network element is an element selected from the group consisting of a Base Transceiver Station (BTS), a Mobile Switching Center (MSC), a Base Station Controller (BSC), a Centralized Base Station Controller (CBSC), a Radio Network Controller (RNC), a Gateway Switching Node (GSN), a Node B, and a mobile unit.

(See rejection of limitations as addressed in claim 5 above.)

Per claim 14:

A checkpointing method of stabilizing a system during an upgrade of services, the system having a primary controller comprising a first version of a control application, a secondary controller comprising a second version of a control application, and a checkpointing service, the method comprising the steps of:

-operating the first version of a control application to control the system; saving state data in a first format,

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- wherein the state data is representative of a stable operation of the system, and wherein the first format of the state data is compatible with the first version of a control application;
- utilizing the checkpointing service to save the state data to the secondary processor;
- upgrading the second version of a control application; quiescing the primary controller;
- operating the upgraded second version of a control application to control the system;
- converting the saved state data from the first format to a second format, wherein the second state data format is compatible with the upgraded second version of a control application;
- operating the second version of a control application to control the system, wherein the second version utilizes the converted state data to ensure stability.

(See rejection of limitations as addressed in claim 1 above. Claim 14 more broadly has the limitation of “the system” in comparison to “wireless communications system” of claim 1. The Holte-Rost invention is not limited to a wireless system.)

Per claim 15:

A checkpointing method of stabilizing a system during a downgrade of services, the system having a primary controller comprising a first version of a control application, a secondary controller comprising a second version of a control application, and a checkpointing service, the method comprising the steps of:

- operating the first version of a control application to control the system;
- saving state data in a first format,
- wherein the state data is representative of a stable operation of the system, and wherein the first format of the state data is compatible with the first version of a control application;

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- utilizing the checkpointing service to save the state data to the secondary processor;
- downgrading the second version of a control application;
- converting the saved state data from the first format to a second format, wherein the second state data format is compatible with the downgraded second version of a control application;
- quiescing the primary controller;
- operating the downgraded second version of a control application to control the system;
- operating the second version of a control application to control the system, wherein the second version utilizes the converted state data to ensure stability.

(See rejection of limitations as addressed in claim 6 above. (Claim 15 more broadly has the limitation of “the system” in comparison to “wireless communications system” of claim 6. The Holte-Rost invention is not limited to a wireless system.)

11. Claims 2, 3, 7, and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent 6,101,327 to Holte-Rost et., in view of US Patent 5,666,293 to Metz et al.

Per claim 2:

A method as defined in claim 1, wherein the wireless communication system further has a version control table containing the version number or the first version of a control application and the second version of a control application.

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Holte-Rost is certainly aware that differing versions exist. Holte-Rost disclosed (col. 4, lines 25-26, “The present invention provides a mechanism to identify which software version is to be used during system upgrade...” Holte-Rost failed to specifically disclose a “version control table containing the version number or the first version of a control application and the second version of a control application.”

However, Metz disclosed (col. 36, lines 31-36) “The DET microprocessor 110 examines the data in the network table (version table) associated with the particular type of set-top to identify the current operating system version number being broadcast for the particular type and/or model of set-top terminal. The system memory 120 also stores a version number for the operating system the DET microprocessor 110 is currently running. The DET microprocessor 110 compares the operating system version number in the network table with the operating system version number stored in its associated system memory 120 to determine whether or not they match. If they match, an operating system upgrade is not necessary at this time,

Therefore, it would have been obvious, to one of ordinary skill in the art, at the time of the invention, to modify Holte-Rost by including more details regarding a version table and comparison of version numbers as disclosed by Metz, because both references refer to downloading / updating / upgrading operating system software in a reliable and secure manner (Metz, col. 4, lines 34-35) (Holte-Rost, col. 3, lines 23-24), ensuring compatibility, thus allowing for changes in versions as desired.

Per claim 3:

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A method as defined in claim 2, wherein the step of upgrading the second version of a control application further comprises the steps of:

- updating the version control table with the new version of the second version of a control application;
- comparing the version number or the first version of a control application to the second version of a control application to determine the second version of a control application has been upgraded.

Holte-Rost is certainly aware that differing versions exist. Holte-Rost disclosed (col. 4, lines 25-26, “The present invention provides a mechanism to identify which software version is to be used during system upgrade...” Holte-Rost failed to specifically disclose a “version control table containing the version number or the first version of a control application and the second version of a control application.”

However, Metz disclosed (col. 36, lines 31-36) “The DET microprocessor 110 examines the data in the network table (version table) associated with the particular type of set-top to identify the current operating system version number (comparing the version number...to determine whether the second version has been upgraded) being broadcast for the particular type and/or model of set-top terminal. The system memory 120 also stores a version number for the operating system the DET microprocessor 110 is currently running. The DET microprocessor 110 compares the operating system version number in the network table with the operating system version number stored in its associated system memory 120 to determine whether or not they match. If they match, an operating system upgrade is not necessary at this time...”

Therefore, it would have been obvious, to one of ordinary skill in the art, at the time of the invention, to modify Holte-Rost by including more details regarding a version table and comparison of version numbers as disclosed by Metz, because both references refer to downloading / updating / upgrading operating system software in a reliable and secure manner (Metz, col. 4, lines 34-35) (Holte-Rost, col. 3, lines 23-24), ensuring compatibility, thus allowing for changes in versions as desired.

Per claim 7:

A method as defined in claim 6, wherein the wireless communication system further has a version control table containing the version number or the first version of a control application and the second version of a control application.

(See rejection of limitations as addressed in claim 2 above.)

Per claim 8:

A method as defined in claim 7, wherein the step of downgrading the second version of a control application further comprises the steps of:

updating the version control table with the new version of the second version of a control application; and comparing the version number or the first version of a control application to the second version of a control application to determine the second version of a control application has been downgraded.

(See rejection of limitations as addressed in claim 3 above.)

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Conclusion

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mary Steelman, whose telephone number is (571) 272-3704. The examiner can normally be reached Monday through Thursday, from 7:00 AM to 5:30 PM. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tuan Q. Dam can be reached at (571) 272-3695. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Mary Steelman

02/16/2005



TUAN DAM
SUPERVISORY PATENT EXAMINER